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Proposal and evaluation of a method to induce a chat leading to organizational learning

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Abstract: Importance of organizational learning has been widely recognized and it has been introduced in various companies in recent years. Informal communication such as a chat is expected to share unexpected but useful information without heavy workload. In this study, therefore, a method to induce a chat has been proposed which can promote organizational learning. In order to implement the proposed method, a resting room has been prepared and a system has been developed in it where work related information on the Internet is displayed on a large display. A case study was conducted to confirm whether the proposed method induced a chat which led to organizational learning or not. Two groups of two female specialists participated in the case study, where they conducted dummy tasks and took a break in the prepared resting room in which the system had been installed. As the result, a few chats leading to organizational learning were induced. In addition, it was found that the proposed method had a possibility to promote their work related chat for the workers who usually talk about their works.

Keyword: organizational learning, informal communication, work-related information

1 Introduction

Recently, companies have recognized the importance of organizational learning and have started to practice the activities. Argyris and Schon mentioned that organizational learning was a performed process by organization's members who had interaction with others or were working on their own inside the community of firm that people acted on behalf of the firm^[1]. By putting the organizational learning activity into practice, they can obtain the strength to adapt the current circumstance and the flexibility to take measures for the future changes. Although the information sharing by communication in the organization is one of the important factors, most of the members cannot share the practical information such as know-how and work related knowledge. The methods to share the information can be classified into two categories. One is a formal method where the information is shared by manuals or formal meetings, and another is an informal method by conversation in their daily activities. The sorts of information in the formal method are decided in advance, while those in the informal method have

wide varieties from their private matters to the public ones. Their daily conversation such as chat in resting room is naturally conducted apart from their work. If the contents of the conversation can be induced to their work related themes, it is possible to share useful information and knowledge without any workload.

In this study, therefore, the authors have focused on the method to share the information by informal communication and have proposed a method to induce a chat which promotes organizational learning. Concretely, an association which can be explained by spreading activation model is employed to lead the contents of the chat to work related matters by presenting suitable information. An information display system has been developed and a case study was conducted using the system.

2 Method to induce chat for organizational learning

2.1 Process to induce organizational learning

URAYAMA Motoki, KITAMURA Takayoshi, KAMIHIGASHI Daisuke, ISHII Hirotake, SHIMODA Hiroshi and FUJINO Hidenori

In this study, the authors have paid attention to the information which cannot be shared by a formal method. They are, for example, small knacks, skills and know-hows which were not recorded and shared by the formal method. In order for them to pick up such information as a theme of their chat, the information associated with the situation is given to the members. The information reminds them of their knowledge and experience and is shared through their chat. Because this process is naturally conducted in their daily work, they don't feel any burden for the activity.

2.2 Principle to induce theme of chat

2.2.1 Spreading activation model and association

Association is utilized to remind them of the work related situation in this study. The mechanism of association can be explained by spreading activation model^[2]. In the model, the relationships of the memorized ideas are expressed by network structure, where the ideas are assigned as nodes and the close ideas are connected with links. When an idea gets activated, the activated status gets spread to the ideas which have close links to the activated idea. When the activation level of the idea increases over a certain threshold, it is recalled in their consciousness.

In this study, the mechanism of the association is utilized to remind them of specific situation related to their work. By showing work related information, the memorized knowledge and experience which have short links with the information get associated and they are talked with others naturally. If the theme of their chat can be controlled by this method, organizational learning can be promoted.

2.2.2 Interpersonal distance

Interpersonal distance is the psychological distance that people feel between them^[3]. When the interpersonal distance is too short, they feel ill at ease. In order to avoid such feeling, they sometimes start talking. In this study, this psychological phenomenon is utilized for them to start chatting. For example, when a resting room is small and the interpersonal distance of the people staying there is short, they start talking. If work related information is provided naturally at that time, they may talk about them. In other words, when there is no conversation among

the members in small informal space, it is possible to make them talk about work related matters if they have information providing devices such as TV and newspaper.

2.3 Method to induce chat for organizational learning

The authors have paid attention to the chat among organization members which often appears in resting rooms or lounge in their workplace. It is natural that they talk about work related matters in the resting room in their office. And it is expected that they talk about various matters because they often have chances to meet other members there. Therefore, an information tool is introduced in a small resting room where work related information is presented and it controls the contents of their chat. In other words, in order to promote organizational learning, a work related information display tool is introduced which reminds them of the associated situations, experience and knowledge and makes them share the experience and the knowledge.

2.4 System development

2.4.1 System functions

The information presented on the tool is collected by "Google Alert"^[4] in advance. The Google Alert is one of the web service where the news and blogs are delivered by RSS feed, which contents are related to the preregistered keywords as alerts. Since the news and blogs on the Internet are described from the various viewpoints, it is suitable to promote their association, for example, they reflect their experience from the contents, or they judge the usefulness of the unknown information from their experience. When the keywords are registered to work related words, the work related information which associates them can be easily collected.

The display method of the collected news and blogs are referred by the method of "Google Trend". In the service of "Google Trend", the most searched keywords are displayed as shown in Fig.1. And they are automatically changed periodically in order to attract their attentions. In this study, a similar display method has been developed as a web service.

Proposal and evaluation of a method to induce a chat leading to organizational learning



Fig.1 Example of Google Trend display.

First, the titles of the news and the blogs are collected by “Google Alert” service where some work related words have been registered as keywords in advance. Then the news titles are displayed as the similar style of “Google Trend” and they are automatically changed periodically. In order to provide the detail contents of the news and the blogs, the whole contents can be displayed on a pop-up window when the title of the news is touched. This means that the information display has a function to detect their touch like a touch display.

2.4.2 Software configuration

Fig.2 shows the software configuration. First, work related keywords are registered in “Google Alert” and RSSs are generated. The news titles and URLs are accessed at a certain timing from the RSS and they are registered into a database. The new titles registered in the database are randomly picked up and the detail contents displayed on the pop-up window are generated. These information are displayed on a large touch display.

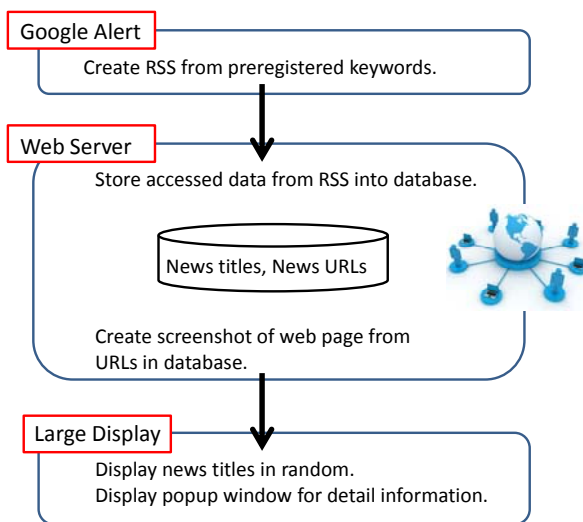


Fig.2 Software configuration.

Fig.3 shows the example of the displayed information. The news titles randomly picked up are displayed in the 8 tiles which are arranged four columns in two lines. Each tile contains 10 news titles and they are changed by the user’s sliding operation or a certain time passes. When the text of the news title contains the preregistered keywords, they are emphasized in different color. When the user touch one of the tiles, the pop-up window appears as shown in Fig.4 where the detail information related to the news title is described. A preliminary experiment was conducted to decide the design of the screen, font type/size of the news titles and color of tiles.



Fig.3 An example of displayed information.



Fig.4 An example of pop-up window.

2.4.3 Hardware configuration

Fig.5 shows the hardware configuration of the system. The necessary hardware is a large touch display which shows the news titles and detects user’s operation, a small PC which obtains information from the Web site and a wireless router which connects with the Internet.

3 Case study

3.1 Purpose

The purpose of the case study is to investigate whether the proposed method can lead the contents of

URAYAMA Motoki, KITAMURA Takayoshi, KAMIHIGASHI Daisuke, ISHII Hirotake, SHIMODA Hiroshi and FUJINO Hidenori

their chat and organizational learning is promoted or not. The concrete purposes are as follows;

- (1) To confirm whether the proposed method can induce work related chat or not.
- (2) To confirm whether the induced chat promotes organizational learning or not.



Fig. 5 Hardware configuration.

3.2 Outline of case study

Two case studies were conducted, and each one was done for one day. The participants were ladies who work as specialists at the same organization. Specialists are usually required advanced knowledge and skills as their profession, therefore they are suitable as the participants of this case study. When starting the case study, a dummy task which was not related to the purpose had been prepared. In order that the participants could chat without hesitation, a resting room was prepared separated from the task room. They spent a break time in the room between the dummy tasks. The information display system had been introduced in the resting room and their chat was observed and recorded with video cameras and a sound recorder. A questionnaire and an interview were conducted at the end of the case study.

3.3 Method

3.3.1 Environment

Two rooms were prepared which were a task room where the participants conducted dummy tasks, and a

resting room where they spent their break time. The reason why the resting room was prepared was that they could chat without hesitation because the instructor of the case study was not in the resting room. It was also the reason that the small resting room could make short interpersonal distance and it could promote to start chatting. Two experimental rooms of Kyoto University were prepared as the task rooms while a small meeting room was prepared as the resting room. They were on the same floor and located close each other as shown in Fig.6. The layout of the resting room is shown in Fig.7. Fig.8 shows the appearance of a large touch display used in this case study.

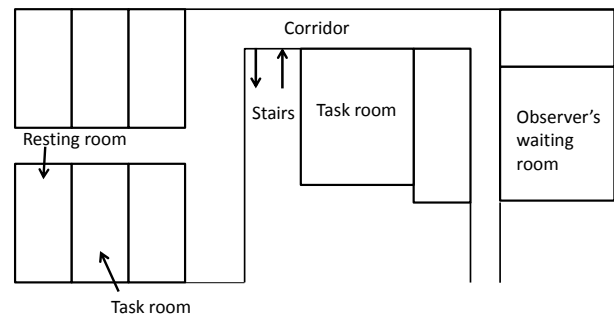


Fig.6 Room locations.

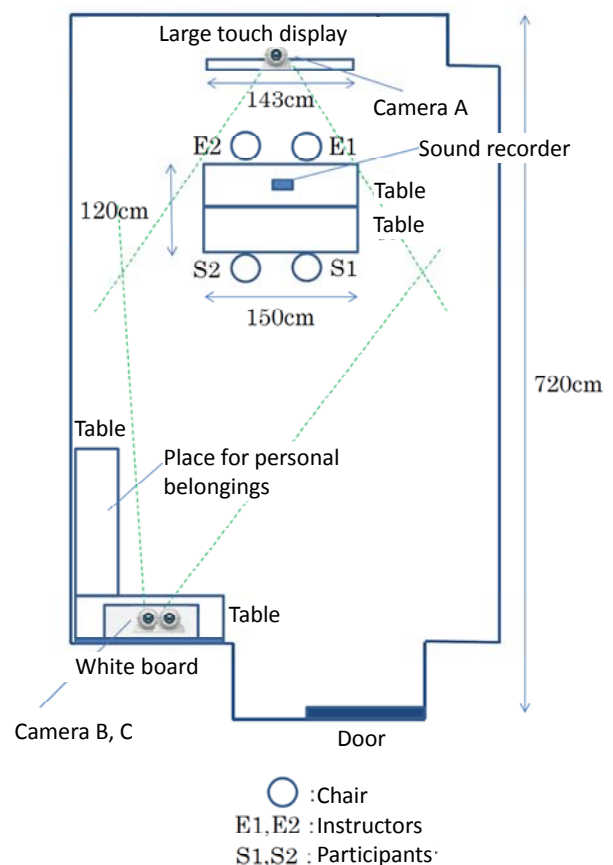


Fig.7 Layout of resting room.

Proposal and evaluation of a method to induce a chat leading to organizational learning

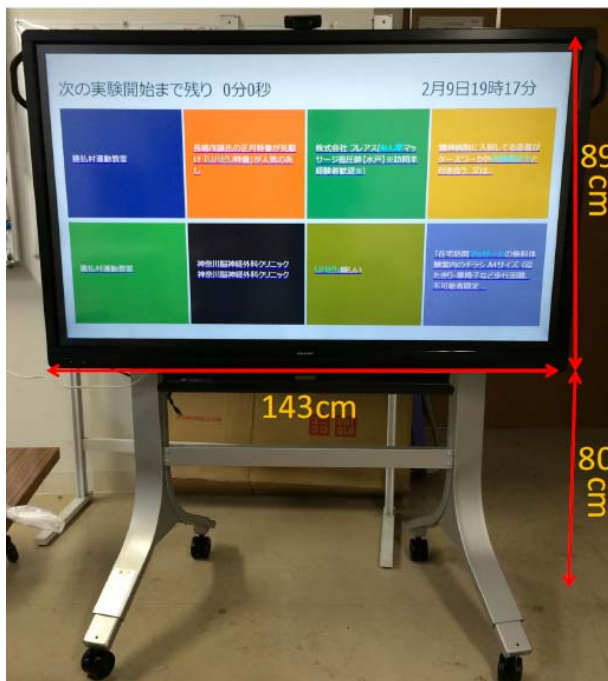


Fig.8 Appearance of large display.

Two chairs where the participants sat were placed to face to the display across the tables in order that the display was naturally in their sights. A sound recorder was set under the table to record their conversation. A display side camera (A-camera) was placed at the front top of the display to observe they were facing to the display. Another camera, a door side camera (B-camera) was also placed at the opposite side of the A-camera. The behaviors of the participants during their break time were recorded with A-camera and B-camera. A real-time camera (C-camera) was also placed at the same place of the B-camera in order to monitor their behaviors and the system working. The image and sound captured by the C-camera was transmitted to the observer who was waiting in another room.

3.3.2 Equipment

Table 1 shows the equipment to conduct the case studies.

3.3.3 Procedure of case study

Table 2 shows the procedure of the case study. The task which was given in the task room was dummy tasks. The target time period for analysis was the break time which was 12:45-13:00, 13:30-13:45, 14:15-14:30 and 15:00-15:15. In the break time in the morning and lunch time, general news such as society,

politics and sports were presented on the large display as shown in Fig.9 in order to make them accustomed to use the system. No news title was presented in the break time in 12:45-13:30 and 14:15-14:30 as shown in Fig.10, while work related news titles were presented in the break time of 13:30-13:45 and 15:00-15:15 as the same format of Fig.9. By comparing the behaviors and chats of the above two display conditions, it would be confirmed whether the work related chat was induced and organizational learning was promoted or not. After SET5 of dummy task, the actual purpose of the case study was told to the participants and a questionnaire and an interview were conducted.

Table 1 Equipment of case study

Equipment	Type, Maker
USB camera	HD Pro Webcam C920 T, Logitech
NUC PC	BOX D54250WYK, Intel
Wireless router	WHR-300, BUFFALO
Large touch display	PNL-603A, SHARP
Note PC	Thinkpad X230, Lenovo
	CF-SX3, Panasonic
	HP Probook 4430s/CT, HP Japan
	PG-GN206Y1G2, NEC
Web Server	Rental server plan, Sakura Internet



Fig.9 General news titles.

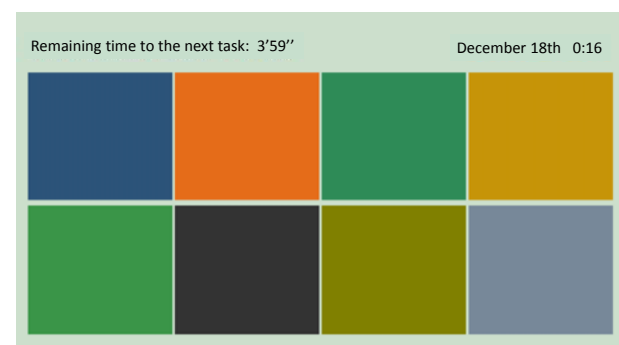


Fig.10 No news title.

URAYAMA Motoki, KITAMURA Takayoshi, KAMIHIGASHI Daisuke, ISHII Hirotake, SHIMODA Hiroshi and FUJINO Hidenori

Table 2 Procedure of case study

Time	Action	Room	Presented title
10:10	Explanation Questionnaire	Resting room	General news
10:30	Task practice *1	Task room	
11:20	Break time	Resting room	General news
11:35	Task SET1 *2	Task room	
12:05	Lunch break	Resting room	General news
12:40	Flicker measurement	Task room	
12:45	Break	Resting room	No news title
13:00	Task SET2 *3	Task room	
13:30	Break	Resting room	Work related
13:45	Task SET3 *2	Task room	
14:15	Break	Resting room	No news title
14:30	Task SET4 *3	Task room	
15:00	Break	Resting room	Work related
15:15	Task SET5 *2	Task room	
15:45	Questionnaire, Interview	Resting room	Work related
16:15	Finish		

*1: Sudoku, receipt classification, Flicker measurement(CFF)

*2: CFF, Sudoku, CFF

*3: CFF, receipt classification, CFF

3.3.4 Instruction to participants

The participants were recruited to be said to join an experiment to investigate their productivity for intellectual work under various room conditions. Before starting the case study, it was explained that the large display was introduced to kill time in break time. And the instructions to the participants are as follows;

- Do not use their smartphones.
- Do not touch equipment except the large touch display.
- Do not go out expect toilet.

3.3.5 Questionnaire and interview

After SET5 of dummy task, the actual purpose of the case study was told to the participants and a questionnaire and an interview were conducted. The questions of the questionnaire include;

- Frequency of chat and its contents in the resting room in their daily work,
- Evaluation of the introduced system.

The following items were asked in the interview base on their recorded behaviors in the resting room and the answers of the questionnaire.

- Impression of dummy task,
- How to spend break time between dummy tasks,
- Contents of chat in their daily work,
- Impressive news titles,

- Possibility to introduce the system into their workplace,
- Others related to the case study.

3.3.6 Participants

Table 3 shows the participants. Two case studies were conducted on December 8th, 2014 and January 12th, 2015. Two female child minders of a nursery school (C1 and C2) participated on December 8th, 2014, while two female masseuses (M1 and M2) participated on January 12th, 2015. They had been worked in the same workplace respectively.

Table 3 Participants

Symbol	Age	Profession	Experience	Friendship
C1	46	Child minder	3 years	40 years
C2	51		More than 5 years	
M1	49	Masseuse	7 years	10 years
M2	42		N/A	

3.4 Result and discussion

3.4.1 Work relate chat

All the utterances of their chats talked in the break time were classified into two categories which are “work related utterance” and “others”. The “work related utterance” means that they are related to the experience in their work or their work system. The utterances such as private life of their colleagues were classified into “others”. The responses following the former work related utterances were classified into “work related utterance”.

First all the utterances were written, then three analysts including an author classified them into the above two categories separately. Two analysts except the author did it after explanation of the features of the participants and classification method. As the result of the classification, the perfect correspondence rate was 82.2%. Then, they discussed different classifications and reclassified them with their agreements. The results of the classification for C1,C2 and M1,M2 are shown in Table 4 and 5 respectively.

By using the classification results, independence tests were conducted to investigate the difference of utterances in the break time between when work related news tiles were displayed and when no news

Proposal and evaluation of a method to induce a chat leading to organizational learning

title was displayed. Table 6 and 7 show the results of the utterances by C1 and C2, while Table 8 and 9 show those by M1 and M2.

Table 4 Classification of utterance (C1,C2)

Break time	News	Work related	Others	Total
12:45-13:00	None	30	76	106
13:30-13:34	Work related	83	42	125
14:15-14:30	None	56	50	106
15:00-15:15	Work related	85	13	98

Table 5 Classification of utterance (M1,M2)

Break time	News title	Work related	Others	Total
12:45-13:00	None	0	73	73
13:30-13:34	Work related	26	46	72
14:15-14:30	None	26	91	117
15:00-15:15	Work related	4	76	80

Table 6 Independence test – observed frequency (C1, C2)

News	Work related	Others	Total
Work related	168	55	223
None	86	126	212
Total	254	181	435

Table 7 Independence test – expected frequency (C1, C2)

News	Work related	Others	Total
Work related	130.2	92.8	223
None	123.8	88.2	212
Total	254	181	435

Table 8 Independence test – observed frequency (M1, M2)

News	Work related	Others	Total
Work related	30	122	152
None	26	164	190
Total	56	286	342

Table 9 Independence test – expected frequency (M1, M2)

News	Work related	Others	Total
Work related	24.9	127.1	152
None	31.1	158.9	190
Total	56	286	342

As the result, p value in case of C1 and C2 is 1.93×10^{-13} and it shows that the proposed method

significantly improved work related conversation. In case of M1 and M2, however, p value is 0.13 and it does not show the significant difference.

Table 10 shows the questionnaire and their results. Although C1 and C2 who were child minders answered that they often talk about works rather than others in their works, the result when no news title displayed showed that other utterances were a little more than work related ones. About M1 and M2 who were masseuses, M1 answered that she talked about her work as often as others and M2 answered that she often talked about her work more than others. However the result showed that the other utterances were more than work related utterances in all the break time.

Table 10 Questionnaire and answers

Question	Choice	Respondent
We often talk about works with colleagues in break time.	Agree Somewhat agree Somewhat disagree disagree	ALL
Which is more frequent, work related theme or others?	Only work related Work related Almost the same Others Only others	C1,C2 M2 M1
I often watched the display in the resting room.	Agree Somewhat agree Somewhat disagree disagree	M2 M1 C1,C2
Why did you watch the display? (Multiple choice allowed)	Current time Remaining time Interesting news Nothing to do Others	M1 M1,M2 C2,M1,M2 C2
Do you think the display promotes conversation if it is installed in resting room?	Yes No I don't know	ALL

As the result, there was a possibility that the proposed method could promote work related chat in case of C1 and C2, though there was no significant difference in case of M1 and M2.

According to the interview of C1 and C2, they meet on all their working days so that they routinely have lots of chances to chat about work related matters. On the other hand, although M1 and M2 work for the same company, they usually work alone because they are masseuses. They only meet once a month at a work meeting and it is supposed that they rarely have

URAYAMA Motoki, KITAMURA Takayoshi, KAMIHIGASHI Daisuke, ISHII Hirotake, SHIMODA Hiroshi and FUJINO Hidenori

a chance to chat in their daily work. This may be the reason why the number of utterances of M1 and M2 was smaller than that of C1 and C2, and there was no significant improvement in case of M1 and M2 when introducing the system. In the future, it should be considered that work related chat can be promoted even in the case when they usually have a few chance to talk about work related matters.

3.4.2 Chat leading to organizational learning

There were a few chats of C1 and C2 leading to learning. For example, when a news title “Children’s Christmas party on December 24th” was displayed, they started to talk about a Christmas song. In their chat, C1 said that she didn’t know the fourth set of the lyrics and C2 told it to C1 by singing the song. It can be said that C1 learned the lyrics through their chat. The relationship between the displayed news title and the chat was asked in the interview. However they didn’t remember that it was associated by the news title so that the relationship was not clear. Considering that the chat started within two minutes while the news title was being displayed among 110 minute break time in total, it may have a relationship between the displayed title and learning through the chat.

3.4.3 Interpersonal distance and its effect

As shown in Table 4 and 5, the utterances of C1 and C2 were more than those of M1 and M2. C1 and C2 answered in the interview that they always chatted in break time of the case study and it was confirmed by the recorded video. On the other hand, M1 and M2 answered in the interview that they sometimes chatted and sometimes did stretching or other things. It was confirmed that there were the several scenes they stopped talking for a while. At that time, they did stretching or used the system to see the displayed information. These activities were supposed to be the activities to avoid feeling ill at ease. In other words, C1 and C2 avoided feeling ill at ease by keeping chatting, while M1 and M2 avoided by doing stretching or using the system. As the result of the questionnaire, all the participants answered positive when asking the question, “Do you think the display promotes conversation if it is installed in resting room?” There is a possibility that the proposed

method promotes conversations by the principle of interpersonal distance.

4 Conclusion

As the result of the case study, it was found that there was a possibility for the proposed method to promote work related chat for the workers who usually talked about work related matters in their daily chat. On the other hand, the system promoted their chat even for the workers who don’t talked about work related matters in their daily work, however, the chats sometimes stopped and they did stretching and used the system to avoid feeling ill at ease. It should be considered that work related chat can be promoted even in the case when they usually don’t talk about work related matters.

It was confirmed that there were a few work related chats which led their learning activities. In the future, the proposed system will be installed into a resting room of an actual workplace for a long term and it should be confirmed whether the method promotes work related chats and organizational learning activities. In addition, the participants of the case studies were females in this study so that the effectiveness in case of male participants should be also considered in further studies.

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